

AN INITIAL STUDY OF WILD HORSE AND BURRO
DEMOGRAPHY: DETERMINATION OF PREGNANCY
AND LACTATION RATES IN VARIOUS HERDS

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Executive Summary:

Blood serum concentrations of reproductive hormones were used to estimate pregnancy rates in 558 wild and free-roaming horses (Equus caballus) from Nevada, Oregon and Wyoming and 165 California burros (E. asinus). Levels of progesterone (PROG), pregnant mare's serum gonadotropin (PMSG) and estradiol-17 β (EST) were determined by radioimmunoassay procedures. Based on comparison with the results of pregnancy diagnosis from rectal palpations (n=124), the following endocrine concentrations were established as criteria sufficient to indicate pregnancy: PROG \geq 0.05 ng/ml; and/or PMSG \geq 3.0 μ g/ml; and/or EST \geq 300 pg/ml. Estimated accuracy of pregnancy diagnoses from endocrine criteria was 80-85%. The mean incidence of pregnancy indicated among mares sampled from Nevada, Oregon and Wyoming was 58.4%, 69.2% and 85.3%, respectively. Statistically significant ($P < 0.05$) variations in pregnancy rates between locations were positively correlated with differences in body weights and mean condition scores. Estimated mean incidence of pregnancy among burros was 79.4%. A surprising finding was the apparent occurrence of some pregnancies among yearling mares and jennies. The observed incidence of lactating females was 35.3% and 44.0% in mares sampled from Nevada and Wyoming, respectively. Incidence of pregnancy between lactating and non-lactating mares did not differ significantly.

The following report documents the results of research on wild and free-roaming wild horses (Equus caballus) and burros (E.

asinus) conducted during 1981 and 1982 under BLM Contract No. AA851-CT1-51. The term "feral" as applied to equids in this report is synonymous with animals classified as "wild and free-roaming horses and burros" and subject to the provisions of PL 92-195. As specified in the contract, the objectives of the study were as follows:

1. Measure age-specific pregnancy rates in horses and burros rounded up by BLM for herd reduction and adoption from numerous herds in the western U.S.A.
2. Measure age-specific lactation rates (percentage lactating) in the above.
3. Calculate the above for individual herds or management districts, and provide demographic interpretations utilizing all information that can be obtained such as respective range condition and type, and equid density.

METHODS

Field Procedures

Blood samples and related biological data were collected from 586 feral horses originating from 5 Nevada (n=281) populations, a single location in Oregon (n=80), 5 populations (n=225) in Wyoming and Colorado and from 170 burros from 3 locations in California.

Actual (scale) weights were obtained from approximately 60% of the mares sampled. In cases where scale weights could not be obtained, we estimated weights from morphometric measurements

(chest girth and length in inches) by the relationship described by Ensminger (1977) for domestic horses.

$$\text{Weight (lbs.)} = \frac{(\text{girth})^2 (\text{length})}{300} + 50$$

To test the applicability of weights estimated by this procedure, scale weights were compared with calculated weights for 52 and 41 animals from Wyoming and Oregon, respectively. Logistical problems precluded obtaining actual weights of all but a few jennies sampled in California.

Visual assessments of body condition were made for the majority of the animals sampled by means of a modification of a scoring system, described by Hennecke et al. (1981) for domestic horses. The mares were "graded" on a scale of 1-9 (ranging from "poor" to "extremely fat," based on the relative degree of fat deposition around the spinous processes, ribs, tailhead, shoulders and withers.

Rectal palpations by licensed veterinarians were employed to determine the pregnancy status of 121 mares (92 at PVC in November and 29 at Rock Springs in December) and 35 jennies (April 1982), from which blood samples had also been drawn. The mares were restrained in the veterinary chutes and lifted in a sling with a fork-lift until their hind feet cleared the ground to prevent injury to the veterinarian performing the palpation. Burros were restrained in lateral recumbancy by "heading and heeling." If a fetus was detected, it was assigned to 1 of the following 3 approximate age classes: ≤ 3 months; $3 < 6$ months; or

6 < 9 months.

Finally, the lactational status ("wet" or "dry") of the animals was assessed visually at the time blood samples were collected.

The original experimental design called for a comparison of pregnancy diagnoses determined by means of serum hormone levels, rectal palpation and ultrasonic pregnancy detection devices. Due to unanticipated cost considerations and uncertainties (based on preliminary tests) as to the effectiveness of the ultrasonic detection devices under field conditions we decided to defer their use until the second year of the study.

Blood Sample Collections

Two blood samples were collected from each animal by jugular venipuncture at the time of inspection by the veterinarian. Blood (50 ml) for serum preparation was collected in 50 ml plastic centrifuge tubes and allowed to clot. Serum was separated from the clot by centrifugation (1,600 x g for 20 minutes). The serum was then aliquoted into three sample vials (5, 5 and 10 ml) and immediately frozen on dry-ice.

An additional 15 ml of blood for harvesting plasma and red cells was collected in 15 ml glass centrifuge tubes to which 1.25 mg of sodium heparin had been added. After collection, the blood was centrifuged at 1,600 x g for 20 minutes to separate plasma from the red cells. The plasma was then decanted into a sample vial and frozen on dry-ice. The remaining red blood cell

fraction was washed twice with isotonic saline, mixed, and centrifuged each time for 20 minutes (1,600 x g), and then transferred to sample vials and immediately frozen on dry-ice.

The hormone assays described below were subsequently run on the serum samples. All samples were kept frozen (-20°C) until the time of assay.

Radioimmunoassay of Hormones

Blood serum samples were analyzed for progesterone (PROG), pregnant mare's serum gonadotropin (PMSG) and estradiol-17 β (EST) by means of radioimmunoassay (RIA). Progesterone and PMSG levels were determined for all samples, while estradiol-17 β levels were measured for those animals that could not be designated as non-pregnant by progesterone and PMSG assays. All assay tubes were counted on a Beckman gamma counter to determine the amount of antibody-bound ¹²⁵I. All hormone levels were determined with the aid of a standardized computer analysis for parallel line assays, and titer estimates were calculated using data from the linear portion of the inhibition curves.

Progesterone

Progesterone titers were determined by a solid-phase RIA kit (Immuchem Covalent-Coat™ Direct (¹²⁵I) Progesterone Radioimmunoassay Kit, Immuchem Corp., 20770 Leapwood Ave., Carson, CA 90748). The antibody, in this particular method, was covalently bound to the inner surface of a polypropylene tube. Thus, antibody-bound antigen was also bound to the tube wall.

No second antibody, charcoal or other agent was needed and no centrifugation was required. At the conclusion of the assay, free antigen was aspirated leaving only antibody bound antigen. The coated tube was then counted in a Beckman gamma scintillation counter to determine the level of antibody-bound ^{125}I .

The antibody used in this assay exhibited cross-reactivity and 50% displacement of 100% for progesterone, 0.17% for pregnenolone, 0.26% for 17α -hydroxyprogesterone, 4.81% for 20α -dihydroprogesterone and 3.08% for deoxycorticosterone.

Pregnant Mares Serum Gonadotropin (PMSG)

PMSG titers were determined by a double antibody homologous RIA method of Farmer and Papkoff (1979) and employed PMSG isolated from serum as antigen and tracer. Both the hormone and the antisera were obtained from a colleague (Dr. Harold Papkoff, Reproductive Endocrinology Center, University of California, San Francisco, CA 94143).

The highly purified PMSG was iodinated by a modification of the chloramine-T method (Greenwood et al., 1963). Labeled hormone was separated from free ^{125}I by gel filtration on Bio-Gel P-60 (50-100 mesh) on a 2 x 20 cm column with 0.01M phosphate-saline buffer, pH = 7.4. The purified hormone also served for standards in the assay.

The rabbit anti-PMSG serum exhibited a 100% cross-reactivity with equine LH (eLH) and a certain low degree of non-parallel cross reactivity with equine FSH (eFSH) (Farmer and Papkoff 1979).

Estradiol-17 β

Estradiol-17 β (E₂) levels were assayed by an RIA kit obtained from Radioassay Systems Laboratories, Inc. (20770 Leapwood Ave., Carson, CA 90746). This method employed a double antibody homologous assay which detected the unconjugated form of the steroid; it does not distinguish true free E₂ from protein bound E₂.

The specificity of the antiserum used in this assay exhibited crossreactivity and 50% displacement of 100% for estradiol-17 β , 6.5% for estriol, 5.2% for estradiol-17 α , 0.55% for estrone and 0.38% for equilin.

RESULTS

Hormone Levels and Pregnancy Diagnosis

A computer compilation of the results of the hormone assays as well as other data from all of the horses and burros sampled is contained in the Appendix.

As shown in Tables 1 and 2, mean levels of serum of progesterone, PMSG and estradiol-17 β differed significantly ($P < 0.05$) with respect to both location and time (month) of collection. The two sources of variation probably are correlated, because sampling efforts at both locations were fairly time-specific. For example over 85% of the Wyoming mares were sampled in August/September and October while a comparable fraction of the Nevada samples were collected in November and the Oregon samples derived exclusively from February collections.

Table 1. Mean levels ($\pm 95\%$ C.I.) of serum progesterone, PMSG and estradiol-17 β in mares by month of collection.

Month of Collection	PROG (ng/ml)	PMSG (μ g/ml)	EST (pg/ml)
Aug.	5.9 (1.5)	4.7 (3.4)	165.1 (40.6)
Sept.	9.6 (2.3)	7.0 (3.5)	344.9 (93.9)
Oct.	3.4 (1.1)	2.7 (1.2)	449.1 (89.6)
Nov.	1.5 (0.5)	1.2 (0.5)	322.7 (36.8)
Dec.	1.1 (0.5)	0.7 (0.7)	346.5 (88.5)
Feb.	1.7 (0.7)	2.5 (1.5)	274.7 (40.6)
	F = 32.6	F = 6.05	F = 4.51
	$\underline{P} < 0.001$	$\underline{P} < 0.001$	$\underline{P} < 0.001$

Table 2. Mean levels ($\pm 95\%$ C.I.) of serum progesterone, PMSG and estradiol-17 β in mares by location.

Location	PROG (ng/ml)	PMSG (μ g/ml)	EST (pg/ml)
Nevada	1.51 (0.33)	1.51 (0.72)	303.8 (25.9)
Oregon	1.81 (1.24)	2.96 (2.28)	290.3 (48.3)
Wyoming	5.71 (1.00)	4.37 (1.45)	419.5 (76.7)
	F = 27.87	F = 4.70	F = 8.92
	<u>P</u> < 0.001	<u>P</u> < 0.05	<u>P</u> < 0.001

Although the observed temporal differences (Table 1) generally reflect the expected chronological changes in hormone levels attendant with the course of pregnancy, there also appears to be a strong component of locational variation (Table 2). We suspect that these differences are associated with regional variations in nutritional plane and/or animal condition. This possibility points out the potential error in the use of endocrine profiles from domestic animals for diagnosis of pregnancy in free-ranging animals, since animals on a low nutritional plane would be expected to have lower hormone titers than animals on full feed.

Hormone levels in relation to the reproductive status of horses as estimated by rectal palpation are summarized in Table 3. The broad confidence intervals for some of the categories, are due to the very small sample sizes ($n < 10$) involved. Based upon interpretation of these results, we established the following criteria as sufficient for diagnosis of pregnancy by endocrine levels:

- | | |
|---------------------------------------|----------|
| (1) PROG \geq 0.5 ng/ml and/or |] = PREG |
| (2) PMSG \geq 3.0 μ g/ml and/or | |
| (3) EST \geq 300 pg/ml | |

We subsequently applied these criteria in an attempt to classify the mares in the palpated sample as either pregnant (PREG) or open (NP). For the purpose of this comparison, we made no distinction among the non-pregnant animals with respect to whether they were cycling or in an anestrus condition. Furthermore, known cases of mares, which had aborted their

Table 3. Mean (\pm 95 C.I.) levels of serum progesterone; PMSG and estradiol-17 β in mare compared to reproductive status estimated by rectal palpation.

Status	PROG (ng/ml)	PMSG (μ g/ml)	EST (pg/ml)
Open			
Anestrous	0.30 (0.30)	1.09 (0.88)	248.0 (46.1)
Cycling	ND ^a	2.28 (4.16)	243.5 (61.6)
Pregnant			
\leq 3 mos.	2.76 (3.25)	3.81 (4.15)	175.5 (89.0)
3 < 6 mos.	2.02 (0.74)	0.50 (0.15)	478.9 (98.6)
6 < 9 mos.	1.23 (0.65)	0.95 (1.46)	498.0 (306.0)
Fetus Aborted	1.83 (3.01)	0.43 (0.19)	222.7 (173.0)

^aND = non-detectable

fetuses were excluded from the analysis. For 124 animals either palpated or necropsied, 94 (75.8%) were classified correctly. Of the three hormone criteria progesterone showed the greatest accuracy (78.9%). PMSG classified less than half (44.4%) of the cases correctly, with estrogen being intermediate (66.4%).

Rectal palpations can be used reliably to determine pregnancy status in horses from the 30th day of gestation or even earlier (cf. Walker 1977). Undoubtedly, they are subject to some degree of error. If one assumes an accuracy of 90-95% for the palpations, the observed agreement of 75.8% between the results obtained by the two methods would suggest an accuracy of 80-85% for the hormone diagnosis of pregnancy status. The validity of this reasoning is corroborated in part by a further test of the hormone criteria in the case of 42 mares, immobilized in February 1982. These animals were part of a larger group of horses captured and outfitted with radio transmitters by the University of Minnesota study team to study early foal survival. Of the 42 animals from which blood samples were obtained, the hormone criteria correctly classified their ultimate reproductive performance in 36 cases (86%). Three of the remaining mares were classified as pregnant (in February) but were not observed with foals the following spring and summer. These discrepancies may be attributable to abortions occurring in the interim.

We also tested our classification criteria against the results of rectal palpation in the case of 35 burros. Agreement between the two methods was comparable (77.1%) to that obtained

for horses.

Pregnancy Rates

Assessments of reproductive status of 121 mares and 35 jennies, estimated by means of rectal palpation, are presented in Table 4. The weighted mean pregnancy rates for all mares of 1 year of age or older were 57% and 59% among Nevada and Wyoming horses, respectively, and 69% for burros.

Approximately 65% of the pregnancies observed in the Nevada and Wyoming samples were estimated to be between 3 and 6 months advanced. Given that the palpations of horses from the two locations were conducted on 11 November and 02 December, respectively, and assuming a median fetal age of 4.5 months (150 days), suggests that the majority of conceptions occurred in June and July. This further suggests a foaling peak in late May and June for horses from the two locations. The age distribution of burro fetuses (determined on 22 April 1982) was distinctly bimodal, with 41% and 50% of the fetuses being either <3 months or >6 months of age, respectively. This evidence indicates a lesser degree of synchrony in conception (and probably parturition) among the burros than was the case for the horses.

Age-specific pregnancy rates in the composite sample of horses and burros are summarized by location in Table 5. Pregnancy diagnosis among those animals not palpated was based on the endocrine criteria described above. Mean incidence of pregnancy across all age classes among the Wyoming horses (85.3%)

Table 4: Pregnancy status of feral horses and burros, determined by rectal palpation.

	Age (years)	Sample size	Percent pregnant
Horses			
Nevada			
	1	9	33
	2	26	50
	3	17	53
	4	1	100
	5	2	100
	6	8	88
	7	10	70
	8	8	63
	9	1	0
	≥10	10	50
	\bar{x}	92	57
Wyoming			
	1	5	20
	2	10	60
	3	3	100
	4	3	67
	5	--	--
	6	1	0
	≥7	7	71
	\bar{x}	29	59
Burros (California)			
	<1	3	0
	1	3	33
	2	13	62
	3	3	67
	4	5	80
	5	2	50
	6	4	100
	≥7	2	100
	\bar{x}	35	69 ^a

^aMean does not include animals <1 year of age.

Table 5. Age-specific pregnancy rates (%) of feral horses and burros from various location, 1981-82.^a

Age (years)	Horses			Burros (California)
	Wyoming	Nevada	Oregon	
1	80.9 (47)	43.2 (44)	--	42.9 (28)
2	71.4 (42)	63.4 (41)	46.7 (15)	78.3 (46)
3	88.9 (27)	66.7 (33)	54.5 (11)	90.0 (20)
4	92.9 (28)	100.0 (8)	69.2 (13)	85.0 (20)
5	100.0 (7)	86.7 (15)	100.0 (1)	89.5 (19)
6	60.0 (5)	73.3 (15)	90.0 (10)	100.0 (9)
7	100.0 (3)	53.1 (32)	90.0 (10)	75.0 (4)
8	100.0 (18)	63.2 (19)	50.0 (4)	100.0 (4)
9	100.0 (12)	12.5 (8)	50.0 (2)	--
10	75.0 (4)	46.2 (13)	80.0 (5)	100.0 (8)
11	80.0 (5)	33.3 (6)	100.0 (1)	100.0 (2)
≥12	88.9 (27)	57.9 (19)	83.3 (6)	100.0 (5)
\bar{x}	85.3 (225)	58.4 (255)	69.2 (78)	79.4 (165)

^aNumbers in parantheses designate sample size

was significantly ($P < 0.05$) greater than those among the Nevada (58.4%) and Oregon (69.2%) horses. As discussed below, we attribute these locational differences in part to regional variations in animal condition.

Lactation Rates

As shown in Table 6, the mean incidence of lactation (44.0%) in the Wyoming sample was higher than among the Nevada animals (35.3%). However, this difference is only marginally significant ($z = 1.94$, $P < 0.10$). Two of 47 (4.3%) of the yearling (20 < 30 months) mares from Wyoming were classified as lactating. If the age determination of these animals was correct, this would indicate that they conceived at 9-10 months of age. The observed difference in the incidence of lactation among 2-year-old mares between the Wyoming and Nevada samples is not statistically significant ($z = 1.23$, $P < 0.20$). We contend that the results of assessment of lactational status based on visual examination alone and without palpation of the udder are biased conservatively. Unless a lactating mare has an obviously distended udder, it may be mis-classified as "dry." This source of error increases as fall progresses and the majority of foals of the current season are weaned. Due to this bias, we made no attempt to estimate lactational status of the mares sampled in February 1982 from Oregon. Likewise the observed lactation rates in the burros sampled in April may be substantially underestimated. In any case, these problems preclude reliable estimation of reproductive performance on the basis of apparent

Table 6. Age-specific lactation rates in feral horses and burros from various locations, 1981-1982.

Age (years)	Percent Lactating ^a		
	Horses		Burros (California)
	Wyoming	Nevada	
1	4.3 (47)	0 (44)	0 (28)
2	11.9 (42)	22.0 (41)	2.2 (46)
3	37.0 (27)	28.1 (32)	15.0 (20)
4	57.1 (28)	50.0 (8)	15.8 (19)
5	85.7 (7)	42.9 (14)	21.1 (19)
6	80.0 (5)	60.0 (15)	22.2 (9)
7	66.7 (3)	46.9 (32)	50.0 (4)
8	83.3 (18)	57.9 (19)	25.0 (4)
9	75.0 (12)	28.6 (7)	--
10	75.0 (4)	76.9 (13)	0 (8)
11	80.0 (5)	66.7 (6)	0 (2)
≥12	85.2 (27)	52.6 (19)	40.0 (5)
\bar{x}	44.0 (225)	35.3 (252)	11.0 (164)

^aNumbers in parantheses denote sample size

lactation rates.

We observed no significant differences ($P < 0.05$) in pregnancy rates among lactating and non-lactating mares (≥ 3 years of age). Thus, the fact that a mare (or jenny) bears a foal in a given year apparently does not diminish the probability of her conceiving during the same calendar year.

Weights and Condition Indices

Comparison of actual (scale) weights with those estimated from morphometric relationships for 52 Wyoming mares showed a highly significant ($r = 0.90$, $P < 0.01$) correlation. As shown by the regression line (Fig. 1), the calculated weights averaged approximately 10% heavier than the actual weights. Based on the results of the regression analysis, the 95% prediction interval for a 1,000 lb. horse is ± 116 lbs. Examination of Fig. 1 shows that the relationship also applies to the weights of animals sampled from Oregon.

Age-specific mean weights of horses collected at the three locations are summarized in Table 7. Examination of the table indicates that the weights of the Oregon and Wyoming animals are comparable, both being significantly heavier than those sampled from Nevada. Possible variations in the genetic origin of the horses from the three locations notwithstanding, the observed weight differential corroborated our subjective evaluation that the Nevada horses were in generally poorer body condition than those from either Oregon or Wyoming, presumably related to

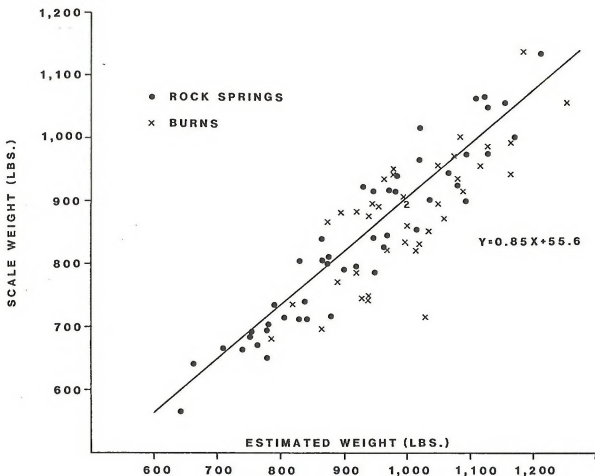


Fig. 1. Relationship between actual weights and weights estimated from morphometric measurements (see text for details) for feral mares from Wyoming (n=52) and Oregon (n=41). The linear regression was developed from the Wyoming data only.

Table 7. Age-specific weights (lbs.) of feral mares from Nevada, Oregon and Wyoming.

Age	Nevada	Oregon		Wyoming	
	Actual	Act.	Est.	Act.	Est.
1	547	--	--	820	986
2	622	774	891	751	822
3	683	785	939	858	967
4	766	859	1,043	949	1,037
5	690	987	--	1,115	1,112
6	802	908	971	822	1,122
7	763	917	991	840	944
8	721	865	1,090	910	1,049
9	951	845	958	897	1,010
≥10	746	890	1,087	885	1,049
\bar{x}	671	852	1,005	852	941

differences in range quality.

Condition indices also showed statistically significant regional variations. The mean condition indices from Wyoming, Oregon and Nevada horses were 5.1, 4.9 and 4.3, respectively. Again the values from Wyoming and Oregon did not differ statistically ($P = 0.05$), but both were significantly greater than those for the Nevada animals ($P < 0.01$).

DISCUSSION AND CONCLUSIONS

Reliability of Endocrine Criteria

Progesterone can be used as a diagnostic tool for pregnancy determination in the mare one estrous cycle after breeding if progesterone rises or remains elevated, but its reliability as a pregnancy test is insufficiently defined at present (Walker 1977). Serum progesterone levels during anestrus or estrus just prior to ovulation are normally less than 0.8 ng/ml in domestic mares (Plotka et al. 1975, Ginther 1979). Progesterone increases and exceeds 2 ng/ml by the third day postovulation. If not bred, the concentration rises to 5-10 ng/ml by the fifth day and then declines to baseline levels 1-2 days prior to the onset of the next estrus with its concomitant LH secretion. When pregnant, progesterone levels decline to 4-6 ng/ml until about the 37th day when they increase to 7-15 ng/ml at about 45-60 days. Progesterone levels are maintained at these levels (with periodic secretory episodes) until about 110-120 days when they decline to about 2-5 ng/ml at about 180-200 days (Evans and Irvine 1975, Evans et al. 1979, Ganjam et al. 1975, Ginther 1979, Nett et al.

1976, Nett and Pickett 1979, Plotka et al. 1982; Stabenfeldt and Hughes 1977).

Of 11 papers estimating pregnancy in mares by bioassay of PMSG (rodent tests) from 2,500 mare serum samples taken 39 to 130 days after breeding (vide Walker 1977), the accuracy was less than 90% for two, 90-94% for two and 95-100% in the remaining seven. Using other immunological tests for PMSG, Wormstrand (1969) reported an accuracy of 96.4% in 50 mares between the days 50 and 100 after breeding. The high accuracy of these tests are due to the relatively short period of time after breeding when PMSG is normally high. Once PMSG secretion by the endometrial cups has been initiated by the fetus, its secretion may continue for weeks even after fetal death (Mitchell 1971). Thus, PMSG assays may indicate higher pregnancy rates than foaling rates due to fetal losses during pregnancy.

Since PMSG is produced by the part of the endometrial cups that are derived from the fetus (Moor et al. 1975), none will be produced during the estrous cycle. After conception and implantation, PMSG is first detected in the blood around 37 days post-ovulation with development of the endometrial cups and placentation. It is not until about 45 days that PMSG is reliably detected in the serum. It increases in the serum to peak levels at about 60 days which are maintained until about 90 days. At this time the levels decline to undetectable levels at 110 to 130 days. Wide variability among animals and large variations in absolute concentrations exist (Ginther 1979).

During this time, the levels of progesterone and PMSG are positively correlated ($r = 0.75$; $P < 0.01$) (Allen 1975). To date, most assays for PMSG utilized antisera against equine LH that cross-reacts with PMSG (Farmer and Papkoff 1979). This investigation would appear to be the first to use a homologous RIA procedure to estimate pregnancy rates in mares (domestic or feral). Although the antibody for PMSG also reacts with equine LH, this does not appear to be a serious problem since during the estrous cycle progesterone levels are low when LH is elevated and during pregnancy LH levels are low but PMSG levels are much higher than the LH levels (Ginther 1979, Nett et al. 1975, Nett et al. 1979, Parker et al. 1975, Stabenfeldt and Hughes 1977, Whitmore et al. 1975).

The mare has 2 unique serum estrogens - equilin and equilenin - in addition to estrone, estradiol-17 and estradiol-17 β (Ginther 1979). Our antibody was specific for the estradiol-17 β . This hormone fluctuates during the estrous cycle within a range of 5-25 pg/ml with a brief peak observed 1-2 days prior to ovulation. Estradiol-17 β increases during pregnancy from a low of 5-10 pg/ml at about 100 days concomitant with a decline in progesterone and PMSG reaching levels of 100-400 pg/ml (Nett et al. 1973, Noden et al. 1978) at around 180 days depending on the assay method used. The high levels of estradiol-17 β are maintained until parturition. Equilin, equilenin, estrone also parallel the estradiol-17 β response to combined levels of 400 to 850 pg/ml. Thus, elevated levels of estradiol-17 β or total

estrogens in combination with progesterone can be used to indicate pregnancy (Ganjam et al. 1975, Ginther, 1979, Nett et al. 1973, Nett et al. 1975, Plotka et al. 1975, Stabenfeldt and Hughes 1977, Terqui and Palmer 1979).

Demographic Implications

Probably the most remarkable feature of the results from this study is the unexpectedly high apparent frequency of pregnancies among yearling mares, particularly in the Wyoming sample (Table 5). This finding contrasts sharply with those of previous investigations. Although Boyd (1979) noted several instances of yearling breeding in horses from the Red Desert of Wyoming, no foalings occurred among 2-year old mares. Similarly, Seal and Plotka (in press) observed no pregnancies in 10 yearling mares from the Challis Management Unit in Idaho.

That some yearling conceptions do occur in the Wyoming and Nevada populations, is suggested by several lines of evidence. Although based on small sample sizes, the results of the rectal palpations (Table 4) indicated yearling pregnancy rates of 20% and 33%, respectively, in these populations. However, the incidence of yearling pregnancies estimated from endocrine criteria in the Nevada sample showed considerably closer agreement with the palpation results than was the case for the Wyoming animals. Lactation rates among 2-year old mares (Table 6) also indicated the occurrence of some successful yearling pregnancies in the previous calendar year. Finally, 3 (7.1%) of

the 42 mares aged 2 years in the Wyoming sample were accompanied by foals of the current year. Notwithstanding possible errors in the differentiation of yearlings from 2-year olds, we conclude that the high incidence of yearling pregnancies among Wyoming mares indicated in Table 5 is not corroborated by other evidence. As already mentioned, the bulk of the Wyoming sample derived from August and September collections. Conceivably, a large fraction of the yearlings may have been cycling at that time, but in most cases these animals either did not conceive or failed to carry their pregnancies to term. The indicated incidence of pregnancy in other age classes of the Wyoming sample may be similarly biased. Ginther (1979) indicated that even in the case of domestic mares raised commercially, a fetal loss of 10% between pregnancy and foaling could reasonably be expected.

Boyd (1979) reported a foaling rate of 78.1% among Red Desert mares aged 3 years and older in 1978. However, following a severe winter in 1979, the foaling rate on the same area dropped to 52.6%, presumably the result of the failure of many mares to carry their pregnancies to term. The apparent pregnancy rate (86.5%) among ≥ 2 -year old mares indicated by endocrine criteria for the Wyoming sample in the present study was even higher than the foaling rate observed by Boyd for comparable age classes after a moderate winter. However, considering the results of rectal palpations, we suspect that the actual foaling rate was somewhat lower, 75-80% may be a more reasonable estimate.

A detailed review of the results of previous studies of fertility rates in feral equids can be found in the report of the National Research Council (1980). It is not our intent to attempt an exhaustive comparison of our findings with those of other investigators. In general terms, the mean pregnancy rates among mares of age 2 years and older in the Nevada and Oregon samples do not differ statistically ($P = 0.05$) from the mean foaling rate (59.6%) reported by Speelman et al. (1944) for range-reared domestic mares of comparable age classes in Montana. Similarly, the mean pregnancy rate (67.7%) estimated by Seal and Plotka (in press) from endocrine criteria for 127 feral mares (yearlings excluded) from Challis, Idaho is statistically equivalent to means from Nevada and Oregon obtained in the present study. Our estimated mean incidence of pregnancy for burros (79.4%) is substantially higher than the unweighted mean (60%) for 6 studies reviewed by the NRC (1980).

The generally small (<100) numbers of animals sampled from various populations within a larger geographic area preclude reliable inferences about possible differences in fecundity rates between such populations. Moreover, because the second year of the originally proposed 2-year investigation was not funded, we had no opportunity to obtain information on differences in environmental variables, range conditions or equid densities for the various populations. This notwithstanding it is our conclusion that the higher pregnancy rates observed among the Wyoming and Oregon horses reflect the existence of comparatively

better forage conditions - probably as the result of higher annual precipitation rates - on the ranges they inhabit than on the more arid Nevada ranges. This contention is substantiated from the evidence provided by condition indices.

The question of rates of increase in feral equid populations has been dealt with in several recent papers (Conley 1979, Wolfe 1980, Eberhardt et al. 1982). In each of these studies, the investigators utilized population modeling techniques to determine hypothetical rates of increase under various combinations of fecundity and survival, including certain "demographic scenarios" under which the rate of increase could equal or exceed 20%. Eberhardt et al. (1982) identified adult survival as the key determinant of rates of increase. Because the present study was not designed to estimate survival rates, our treatment of the question of rates of increase must remain within the realm of speculation. In general, however, the observed reproductive rates do not meet the levels specified by the above investigators, under which rates of increase of $\geq 20\%$ are achievable.

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20	001079	160282	2 3 2	0 60	1 0		0950	0948				2.68			<0.50
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440	880014	180282	2 3 1	0 20	1 0	50	0725	0740	0939	140	69	56	4.01		<0.50

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1210 110062	060282	2 4 2	040	1							1.33		200.8	<0.50 062	
1220 110063	060282	2 4 2	050	1							1.80		324.4	<0.50 063	
1230 110065	060282	2 4 2	030	0							3.78			<0.50	
1240 110077	060282	2 4 2	090	0							0.75			15.67 077	
1250 110078	060282	2 4 2	055	0							1.02		242.7	<0.50 078	
1260 110080	060282	2 4 2	080	1							0.08		123.9	<0.50 080	
1270 110083	060282	2 4 2	020	0							0.00		117.9	<0.50 083	
1280 110084	060282	2 4 2	100	1							5.15			<0.50	
1290 110089	060282	2 4 2	060	1							1.50		258.2	<0.50 089	
1300 110098	060282	2 4 2	020	0							3.14			68.36	
1310 110023	070282	2 4 1	125	1										023	
1320 110028	070282	2 4 1	060	1										028	

000000 000111111 11 1 1 222 2 2 2 222 23333 3333 3344 4444 444 455 55555 555666666 6666777 77777 778
 123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

ID	DATE	SLP	POD	AGE	C	L	P	C	O	WE	IGHT	S	H	O	L	PROG	ESTRO	PMSC	F
NUMB		CAU	OT	CL	AA	CT	TP	ND		EST	ACT	CAL	I	R	N	EST	GEN		A
SEQ		ITL	RA	AA	IT	IT	IT	IT					T	H	T	ONE			L
		SON	NN	NN	NN	NN	NN	NN											

IIIIII	DDMMYY	I	I	I	ID	I	I	II	IIII	IIII	IIII	ID	I	II	IIII	IIIIII	IIII	III
1330	110031	070282	2	4	1	075	1								0.00	175.5	<0.50	031
1340	110034	070282	2	4	1	110									2.06	498.8	<0.50	
1350	110036	070282	2	4	1										3.59		<0.50	036
1360	110037	070282	2	4	1	100	1										<0.50	037
1370	110038	070282	2	4	1	125	1								0.78	423.0	<0.50	038
1380	110039	070282	2	4	1	070	1								0.37	165.6	<0.50	
1390	110140	070282	2	4	1	100	1	0							18.57		<0.50	
1400	110041	070282	2	4	1	090	1								0.02	147.9	<0.50	041
1410	110044	070282	2	4	1	070	1								0.00	96.8	<0.50	044
1420	110046	070282	2	4	1	090	0								0.00	272.7	<0.50	
1430	110048	200282	2	4	1	100	1	0									<0.50	
1440	110095														2.00	433.4	<0.50	
1450	110096														5.09		<0.50	
1460	110099														0.92	221.7	<0.50	
1470	110100														0.00	167.8	<0.50	
1480	805688	250881	2	1	5	030	0		1000			151			3.74			0.38
1490	805689	250881	2	1	5	050	1		0950			150			8.06			719
1500	805692	250881	2	1	5	025	0		0900			141			4.20		<0.50	
1510	805695	250881	2	1	5	015	0		0800			140	70		1.68	174.8	1.96	
1520	805701	250881	2	1	5	060	1		0950		1027	150	70	59	5.31		9.16	721
1530	805702	250881	2	1	5	060	1		1500		1218	151	74	64	0.00			700
1540	805703	250881	2	1	5	020	0		0950		0800	140	64	35	13.87		46.10	
1550	805704	250881	2	1	5	020	0		1000		0933	150	67	39	1.54			
1560	805705	250881	2	1	5	020	0		0950		0767	141	62	36	3.03			
1570	805707	250881	2	1	5	020	0		0800		0846	140	66	34	4.89			
1580	805708	250881	2	1	5	040	1		1000		1050	150	69	63	0.57	226.5	0.01	
1590	805713	250881	2	1	5	015	1		0800		0785	141	64	33			16.44	697
1600	805714	250881	2	1	5	015	0		0800		0751	133	63	33	5.55		<0.50	
1610	805716	250881	2	1	5	050	0		1000		1112	141	73	39	7.66		4.30	
1620	805718	250881	2	1	5	040	1		1050		1027	142	70	39	2.20			
1630	805000 R1	250881	2	1	5	150	1				0981			70	37	0.00	152.4	<0.50 381
1640	805720	250881	2	1	5	015	0		0750		0656	133	57	36	0.00	82.4	0.07	
1650	805725	260881	2	1	5	020	0		0950		0948	142	70	55	4.81			
1660	805726	260881	2	1	5	015	0		0950		0882	143	66	38	3.43			
1670	805727	260881	2	1	5	130	1		1050		1182	160	74	62	15.84			730
1680	805728	260881	2	1	5	015	0		0800		0984	140	69	38	6.88		<0.50	
1690	805732	260881	2	1	5	015	0		0900		0929	143	68	57	10.60			
1700	805733	260881	2	1	5	040	1		0950		1046	150	70	61	5.20			
1710	805734	260881	2	1	5	080	1		0975		1247	152	73	66	9.91		<0.50	
1720	805735	260881	2	1	5	020	0		0950		0885	143	67	55	10.05		<0.50	
1730	805736	260881	2	1	5	015	0		0900		0894	142	65	59	16.55		4.65	
1740	805737	260881	2	1	5	100	1		0950		0978	143	67	62	0.70			723
1750	805739	260881	2	1	5	040	1		1000		0990	143	68	61	0.00	234.5	0.01	
1760	805740	260881	2	1	5	015	0		0800		0734	133	60	57	0.00		4.65	

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123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

ID	DATE	S L P	AGE	C L P	C O	WEIGHT	H	G	L	PROG	ESTRO	PMSO	F
NUMB		POO		O A A	C N	B	E	I	E	EST	GEN		O
SEQ		E C F		L C L	O T P	ACT	I	R	N	ONE			A
		I T L		R A A	I		H	T	H				L
		E I A		T T T	I								
		S O T		I I I	I								
		S O N		N N N	N								

II III	DDMMYY	I I I	I I I	I I I	I I	II II	II II	II II	II II	II II	II II	II II	II II
2210	805981	020981	2 1 2	020	C	50	0850	141	65	60	25.25		1.593
2220	805982	020981	2 1 2	070	C	50	0800	140	69	61	69.49		8.39
2230	805984	020981	2 1 2	130	1	50	1000	143	77	63	10.24		<0.10
2240	805985	020981	2 1 2	030	1	40	0800	141	66	58	2.88		<0.10
2250	805987	020981	2 1 2	203	1	40	0900	143	71	59	9.02		0.69
2260	805989	020981	2 1 2	140	1	60	0850	141	70	61	2.02		<0.10 904
2270	805989	020981	2 1 2	040	1	50	0800	141	63	55	9.19		<0.10 897
2280	805986	020981	2 1 2	100	1	40	1000	143	67	56	4.32		<0.50 890
2290	805988	020981	2 1 2	245	1	40	0900	143	69	57	10.70		<0.10
2300	805901	020981	2 1 2	015	0	40	0700	132	63	49	27.15		42.96
2310	805903	020981	2 1 2	090	1	40	0850	142	62	59	19.10		1.23 886
2320	805907	020981	2 1 2	030	0	50	0800	140	61	56	12.88		6.54
2330	805908	020981	2 1 2	020	0	50	0700	131	60	53	14.23		
2340	805909	020981	2 1 2	015	0	50	0650	130	56	49	0.00	330.9	<0.10
2350	805910	020981	2 1 2	015	0	50	0650	130	57	55	4.21		30.26
2360	805911	020981	2 1 2	180	1	50	1000	150	68	60	13.11		1.323
2370	805912	020981	2 1 2	020	0	60	0750	140	62	55	22.17		<0.10
2380	805913	020981	2 1 2	080	1	30	0900	142	70	61	14.58		38.11 888
2390	805914	020981	2 1 2	013	0	50	0700	130	57	53	6.06		<0.10
2400	805915	030981	2 1 2	020	0	60	0800	140	61	54	0.00	212.2	<0.50
2410	805918	030981	2 1 2	020	0	50	0850	142	66	57	0.00	188.5	<0.50
2420	805919	030981	2 1 2	013	0	40	0800	140	63	55	9.61		1.37
2430	805922	030981	2 1 2	013	0	50		60	54	20.03			38.49
2440	805927	030981	2 1 2	090	1	60	1100	151	73	63	5.86		5.87
2450	805929	030981	2 1 2	050	1	55	0950	143	68	61	2.34	293.2	0.538
2460	805932	030981	2 1 2	090	1	50	0900	141	67	61	13.10		0.098
2470	805938	030981	2 1 2	130	1	55	0950	143	67	64	4.30		0.13 946
2480	805939	030981	2 1 2	180	1	55	0950	140	68	62	9.17		4.19
2490	805940	030981	2 1 2	110	1	45	0950	142	70	54	11.25		<0.10 926
2500	805941	030981	2 1 2	110	1	40	0900	140	68	62	21.19		2.97
2510	805943	030981	2 1 2	150	1	50	1000	142	72	64	2.77		<0.50 969
2520	805944	030981	2 1 2	040	1	45	0900	143	68	59	17.74		0.01 968
2530	805945	030981	2 1 2	050	1	45	1000	143	72	61	6.97		<0.50
2540	805947	030981	2 1 2	050	1	55	0900	141	68	61	6.46		19.56 937
2550	805948	030981	2 1 2	013	0	50	0700	133	62	54	18.59		53.23
2560	805950	030981	2 1 2	013	1	40	0800	140	64	55	6.60		38.94
2570	805954	040981	2 1 2	020	0	60	0850	140	65	55	3.67		<0.50
2580	805957	040981	2 1 2	130	1	45	0900	141	73	62	3.01		0.13 967
2590	805958	040981	2 1 2	020	0	55	0750	133	63	52	8.41		0.448
2600	805963	040981	2 1 2	013	0	55	0600	123	58	53	0.05	325.9	<0.10
2610	805964	040981	2 1 2	013	0	60	0650	130	62	54		403.1	2.85
2620	805966	040981	2 1 2	040	0	60	0750	140	73	56		427.5	0.08
2630	805972	040981	2 1 2	040	1	60	1000	150	73	62	4.52		<0.50 973
2640	805975	040981	2 1 2	120	1	50	0800	140	66	61	4.05		0.691 928

000000 00011111 11 1 1 222 2 2 2 222 23333 3333 3344 4444 444 455 55555 55566666 6666777 77777 778
123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

ID	DATE	S L P	AGE	C L P	C O	WE	IGHT	S	H	O	L	PROG	ESTRO	PMBO	F
NUMR		POO		AA	CL	EST	ACT	CAL	E	I	E	EST	GEN		O
SEG		CAU		RA	ND				G	R	N	ONE			A
		ITL		TT	I				H	T	H				L
		ST		NN	NN										

II	III	II	III	II	III	II	III	II	III	II	III	II	III	II	III	II	III
2690	805977	040981	2 1 2	030	0	60	0900		141	68	59	9.98				5.53	
2660	805977	040981	2 1 2	040	1	45	0850		140	68	55		322.2			1.16 925	
2670	806130	040981	2 1 2	130	1	55	0950		150	71	61	8.69				13.59 971	
2680	805983	040981	2 1 2	090	1	60	0950		142	70	61	1.45	324.0			0.744 976	
2690	805986	040981	2 1 2	130	1		0900		142	69	59	1.62	319.1			<0.50	
2700	805987	040981	2 1 2	015	0	55	0700		133	61	56	15.66				1.457	
2710	805988	040981	2 1 2	030	1	40	0750		140	61	56					<0.10	
2720	806130	131081	2 1 2	020	0	55	0800 0920 1005		142	68	62	1.56	770.9			<0.50	
2730	806132	131081	2 1 2	015	0	50	0800		133	64	56	23.12				7.97	
2740	806136	131081	2 1 2	030	1		0800		142	71	59	0.68	438.9			<0.50 150	
2750	806137	131081	2 1 2	015	0		0650 0655 0710		120	60	55	1.69	1729.2			<0.50	
2760	806138	131081	2 1 2	040	0	60		1065 1109	150	71	63	18.95				0.15	
2770	806140	131081	2 1 2	030	1	55		1000 1169	150	73	63	0.00	160.1			0.18 141	
2780	806142	131081	2 1 2	120	1	45	0850 0840 0943		141	68	58	3.10				<0.50 131	
2790	806143	131081	2 1 2	015	0	55	0650 0650 0778		143	63	55	14.67				<0.50	
2800	806144	131081	2 1 2	070	1		0800 0840 0944		142	68	58	2.65				0.714 160	
2810	806146	131081	2 1 2	090	1	50	0850 0790 0897		142	68	55	1.20	246.5			<0.10 147	
2820	806149	131081	2 1 2	040	0		0700 0685 0755		140	62	55	0.00	361.0			<0.10 155	
2830	806192	131081	2 1 2	080	1		0750 0810 0873		133	67	55	7.50				8.44 145	
2840	806193	131081	2 1 2	020	1	45	0850 0710 0841		141	64	58	10.35				139	
2850	806194	131081	2 1 2	030	1	35	0700 0705 0780		133	62	57	3.30				<0.50	
2860	806196	131081	2 1 2	015	0	55	0550 0565 0644		123	58	53	1.79	557.2			<0.50	
2870	806197	131081	2 1 2	150	1	45	0750 0785 0950		140	66	62	0.00	270.8			<0.50 134	
2880	806198	131081	2 1 2	060	1	50	0900 0		143	69	61	0.18	562.6			<0.50	
2890	806161	151081	2 1 2	015	0	55	0700 0665 0742		140	62	54	11.02				34.94	
2900	806162	151081	2 1 2	080	1	55	0800 0940 1050		142	69	63	1.51	63.1			<0.10 164	
2910	806163	151081	2 1 2	180	1	45	0900 0965 1063		142	70	62	4.29				<0.10 171	
2920	806165	151081	2 1 2	020	1	40	0750 0805 0831		141	63	59	0.00	267.1			0.002	
2930	806167	151081	2 1 2	020	0		0730 0690 0757		143	61	57	0.00	422.6			<0.50	
2940	806168	151081	2 1 2	020	0	55	0650 0735 0790		140	63	56	4.68				0.20	
2950	806169	151081	2 1 2	030	1	50	0700 0805 0863		141	66	56	3.21				16.74	
2960	806170	151081	2 1 2	015	0	45	0700 0640 0664		140	59	53	0.00	379.5			<0.50	
2970	806172	151081	2 1 2	040	0	50	0800 0915 0943		150	66	58	0.00	310.3			<0.10	
2980	806173	151081	2 1 2	040	1	40	0850 0865 1018		142	69	61	0.32				3.89	
2990	806174	151081	2 1 2	030	0	45	0900 0920 0929		150	68	57	6.59				<0.10	
3000	806176	151081	2 1 2	015	0	45	0800 0710 0831		140	63	59	0.00	239.8			<0.10	
3010	806178	151081	2 1 2	015	0	60	0700 0840 0866		133	65	58	5.45				15.86	
3020	806180	151081	2 1 2	040	1	60	0900 1065 1121		142	72	62	3.78				<0.50 191	
3030	806181	151081	2 1 2	020	0	55	0950 1015 1018		143	69	61	0.26	838.9			<0.50	
3040	806183	151081	2 1 2	090	1	50	0850 0915 0978		143	67	62	3.07				<0.50 184	
3050	806185	151081	2 1 2	010	0	55	0950 0940 0956		142	69	59	0.67	993.5			<0.10	
3060	806186	151081	2 1 2	080	1	55	0850 0845 0970		142	69	58	13.06				17.19	
3070	806187	151081	2 1 2	015	0	55	0700 0670 0764		131	63	54	1.02	391.1			<0.50	
3080	806188	151081	2 1 2	090	1	60	0900 1135 1092		150	71	62	0.30	377.6			<0.50	

000000 00011111 1 1 1 222 2 2 2 222 23333 3333 3344 4444 444 455 55555 555666666 6666777 77777 778
123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

ID	DATE	SLP	AGE	CLP	C	WE	IGHT	S	H	G	L	PROG	ESTRO	PMSG	F
NUMB		P		A	A	EST	ACT	CAL	E	I	E	EST	GEN		O
		CAU		OT	CL				I	R	N	ONE			A
SEG		ITL		R	A				O	T	G				L
		EIA		T	T				H	H					
		SOT		I	I				T						
		NN		NN	NN										

IIIIII	DDMMYY	I	I	I	I	I	II	IIII	IIII	IIII	IID	II	II	IIII	IIIIII	IIII	III
0090	806189	151081	2	1	2	080	1	55	0800	0915	0974	140	68	60	0.60	822.1	<0.10 182
3100	806192	161081	2	1	2	040	1	60	1000	0925	1079	142	70	63	1.35	384.7	<0.10 203
3110	806195	161081	2	1	2	060	1	60	1100	0950		150			0.13	699.2	<0.50
3120	806199	161081	2	1	2	090	0		0950	0845		142	67		3.21		20.20
3130	806201	161081	2	1	2	030	1	45	0800	0790	0883	141	64	61	0.01	338.4	1.92 190
3140	806202	161081	2	1	2	030	0	50	0900	0900	1033	142	69	62	0.54	1184.0	0.05
3150	806205	161081	2	1	2	040	0	50	1000	1050	1128	142	70	66	1.26	1126.8	<0.50
3160	806206	161081	2	1	2	030	0	50	0750	0831	142	63	59	0.00	270.1	<0.50 204	
3170	806207	161081	2	1	2	030	0	55	1000	0975	1128	143	70	66	0.78	1185.4	<0.50
3180	806002	R3 161081	2	1	2	080	1		1000	0965					6.05		<0.50
3170	806233	271081	2	1	3	015	0		0700	0715	0878	140	66	57	3.19		<0.50
3200	806234	271081	2	1	3	080	1	50	0800	0855	1013	142	70	59	0.91	107.2	0.94
3210	806237	271081	2	1	3	020	C				1092	152	71	62	1.75		15.06
3220	806238	271081	2	1	3	040	1	45		0925	1095	143	70	64	6.03		0.07
3230	806242	271081	2	1	3	080	1	60	0950	1055	1056	142	72	64	1.78	375.8	<0.50 239
3240	806244	271081	2	1	3	080	0	55		0975	1092	142	71	62	3.25		<0.50
3250	806245	271081	2	1	3	090	C	50		0900	1092	143	71	62	6.14		11.88
3260	806247	271081	2	1	3	015	C			0695	0778	140	63	55	0.00	100.4	<0.50
3270	806248	271081	2	1	3	100	1	50		0825	0965	142	66	63	1.59	786.7	<0.50 230
3280	806254	281081	2	1	3	020	0	45	0700	0715	0804	141	63	57	0.00	75.8	<0.10
3290	806262	281081	2	1	3	020	0	55	0750	0795	0918	142			58.26.92		1.47
3300	806266	281081	2	1	3	050	1		0800			141			14.69		7.03
3310	806267	281081	2	1	3	120	1	60	1100	1135	1212	150	75	62	3.36		<0.50
3320	806271	281081	2	1	3	015	0	55	0700	0740	0839	140	65	56	1.35	626.1	<0.10
3330	806274	281081	2	1	3	040	1	55		1045					4.00		1.13
3340	806275	281081	2	1	3	080	1	45		0910					1.71	427.9	<0.50
3350	806278	281081	2	1	3	180	1	35		0830					1.13	169.2	<0.10
3360	806279	281081	2	1	3	050	1	50		1115					7.46		20.75
3370	806284	281081	2	1	3	080	0	45		0925					1.83	910.4	<0.10
3380	806003	R4 281081	2	1	3	170	1	45		0920					0.73	381.4	<0.50
3390	806286	281081	2	1	3	040	0	55		0890					12.04		5.90
3400	806288	281081	2	1	3	020	1	50		0785					0.00	238.2	0.092
3410	806290	281081	2	1	3	030	0	50		0875					5.60		<0.50
3420	241127	021281	2	1	6	150	0	5		0825					0.00	247.9	0.083
3430	806442	021281	2	1	3	090	0	2	50	0800					1.00	1923.3	0.115
3440	806356	021281	2	1	3	020	0	3	50	0825					1.73	341.5	0.13
3450	806422	021281	2	1	3	140	0	3	50	0975					0.39	188.0	<0.10
3460	806380	021281	2	1	3	110	0	5	45	0820					0.00	55.0	23.26
3470	241170	021281	2	1	6	180	0	2	50	0830					1.17	1063.8	<0.50
3480	806374	021281	2	1	3	060	0	6	50	0695						583.9	1.07
3490	241173	021281	2	1	6	100	0	0	50	0795					0.78	153.8	<0.50
3500	806001	021281	2	1	3	140	0	2	40	0965						221.1	0.569
3510	806495	021281	2	1	3	020	0	2	55	0915					0.22	437.2	0.452
3520	806438	021281	2	1	3	010	0	5	30	0725					0.00	125.8	0.272

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123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2343 678 901 23456 789012345 6789012 34567 890

ID	DATE	SLP	POD	AGE	CLP	CLP	C	WE	IGHT	S	H	O	L	PROG	ESTRO	PMSC	F
NUMB		ECUP	OTL	RAA	CLL	CLL	N	EST	ACT	CAL	I	R	N	EST	GEN		Q
SEQ		ITL	RAA	RAA	TTT	TTT	I				G	T	G	ONE			A
		SON	NN	NN	NN	NN	N				T	H	H				L

IIIIII	DDMMYY	I	I	I	I	I	I	II	IIII	IIII	IIII	II	II	II	IIII	IIIIII	IIIIII
3530	806511	021281	2	1	3	020	0	2	50		0940				1.47	272.1	<0.50
3540	806295	021281	2	1	3	040	0	2	50	0850					0.18	1190.2	<0.10
3550	806323	021281	2	1	3	040	0	6	60		0955				0.63	564.0	<0.50
3560	806357	021281	2	1	3	020	0			0500							
3570	806536	021281	2	1	3	020	0	3	50	0650					0.54	974.1	0.682
3580	806419	021281	2	1	3	010	0	6	55		0630				0.00	94.9	<0.50
3590	806556	021281	2	1	3	020	0	6	55		0680				0.00	100.9	<0.10
3600	806271	021281	2	1	3	010	0	1	60		0840				0.89		<0.10
3610	806517	021281	2	1	3	020	0	2	50		0735				1.52	30.0	<0.50
3620	806538	021281	2	1	3	010	0	6	55	0550	0840				0.00	200.9	<0.50
3630	806434	021281	2	1	3	030	0	3	55	0850					1.12	04.3	<0.50
3640	806540	021281	2	1	3	040	0	2	50		0900				0.50	329.3	0.186
3650	806341	021281	2	1	3	010	0	6			0945				0.00	473.1	0.33
3660	806389	021281	2	1	3	020	0	1	50	0800	0755				0.00	149.7	0.51
3670	806527	021281	2	1	3	020	0	3							0.70	977.0	0.22
3680	806514	021281	2	1	3	030	0	2							0.92	320.1	<0.10
3690	806417	021281	2	1	3	020	0	5							0.00	194.5	0.14
3700	806520	021281	2	1	3	020	0	6							0.00	219.1	<0.10
3710	806539	021281	2	1	3	030	0	2							0.55	310.0	<0.50
3720	806426	021281	2	1	3	020	0	4							0.00	119.5	0.14
3730	491262	101081	2	2	2	070	1	6	45		1645	133			0.00	196.8	0.004
3740	491263	101081	2	2	2	070	1	2	40		0830	140			1.64	143.3	<0.50
3750	491264	101081	2	2	2	060	1	1	40		0820	140			0.96	46.4	6.87 279
3760	491265	101081	2	2	2	070	1	6	40		0840	143			0.00	398.0	<0.50 278
3770	491266	101081	2	2	2	050	1	2	40		0855	143			1.79	704.1	<0.10
3780	491267	101081	2	2	2	030	1	6	50		0715	142			0.00	215.3	0.23 277
3790	491268	101081	2	2	2	060	1	3	45		0780	140			0.68	317.7	<0.50
3800	491269	101081	2	2	2	030	1	1	45		0815	142			6.84		<0.50
3810	491270	101081	2	2	2	070	1	2	40		0755	141			3.86	457.1	<0.50
3820	491271	101081	2	2	2	030	1	6	45		0695	140			0.00	281.4	<0.50
3830	491272	101081	2	2	2	020	1	6	40		0700	142			0.00	119.3	<0.50
3840	491273	101081	2	2	2	080	1	2	45		0760	132			0.00	481.9	<0.50
3850	491282	101081	2	2	2	020	1	6	40		0485	122			0.00	206.0	7.39
3860	491283	101081	2	2	2	100	1	6	35		0625	132			4.86	257.1	<0.50
3870	491284	101081	2	2	2	100	1	1	40		0830	140			3.66		<0.10
3880	491285	101081	2	2	2	130	1	2	30		0690	131			0.00	266.1	<0.50
3890	491286	101081	2	2	2	080	1	6	35		0615	131			1.28	363.3	<0.50
3900	491287	101081	2	2	2	030	1	2	40		0575	131			0.29	538.5	<0.50
3910	490987	021181	2	2	4	070	0	50		0990					0.00	273.6	1.38
3920	490988	021181	2	2	4	070	0	40		0808					1.15	208.6	<0.50
3930	490989	021181	2	2	4	030	0	50		0735					1.00	188.3	<0.50
3940	490990	021181	2	2	4	070	0	40		0768					0.00	141.1	<0.50
3950	490991	021181	2	2	4	030	0	50		0656					0.06	52.1	<0.50
3960	490992	021181	2	2	4	100	0	40		0916					19.45		0.898

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123456 789012345 67 9 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

ID	DATE	S L P	C L P	C	WE	IGHT	S	H	I	E	PROG	ESTRO	PMSG	F
NUMB		POO	AOE	CLP	EST	ACT	CAL	I	R	N	EST	GEN		O
SEQ		CAU		CLP				T	T	T	ONE			A
		ITL		RAA										L
		EIA		TTT										
		SOT		III										
		NN		NN										

IIIIII	DDMMYY	I	I	I	I	I	I	II	IIII	IIII	IIII	IID	II	II	IIII	IIIIII	IIII	III
3970	490993	021181	2	2	4	030	0	60	0720						1.48		18.67	
3980	490994	021181	2	2	4	030	0	50	0860						0.18	630.2	0.37	
3990	490995	021181	2	2	4	020	0	6	40						0.00	193.3	<0.50	
4000	490996	021181	2	2	4	070	0	40	0848						0.44	465.7	<0.50	
4010	490997	021181	2	2	4	020	0	50	0564						0.00	394.3	<0.50	
4020	490998	021181	2	2	4	010	0	50	0665						8.57		0.14	
4030	490999	021181	2	2	4	080	0	50	0858						4.56		<0.50	
4040	491000	021181	2	2	4	070	0	50	0886						0.00	58.2	<0.50	
4050	491001	021181	2	2	4	020	0	40	0627						0.00	348.9	<0.50	
4060	491002	021181	2	2	4	030	0	60	0485							683.9	<0.10	
4070	491003	021181	2	2	4	010	0	50	0770						0.00	11.3	<0.50	
4080	491004	021181	2	2	4	010	0	40	0630						0.00			
4090	491005	021181	2	2	4	070	0	50	0870						1.54	277.2	<0.10	
4100	491006	021181	2	2	4	010	0	6	50						0.01	205.5	<0.50	
4110	491025	021181	2	2	4	080	1	30							0.00	322.2	0.14 033	
4120	491026	021181	2	2	4	050	1	50							4.39		0.19	
4130	491027	021181	2	2	4	070	1	30	0677						0.88	377.1	<0.50	
4140	491028	021181	2	2	4	130	1	30	0765						0.00	113.9	0.901	
4150	491036	031181	2	2	2	020	0	3	50	0847	140				0.60	857.0	<0.10	
4160	491037	031181	2	2	2	020	0	50	0719	140					16.83		1.17	
4170	491038	031181	2	2	2	090	0	40	0803	141					0.00	183.6	<0.50	
4180	491039	031181	2	2	2	030	0	40	0967	143					0.05	206.2	<0.50	
4190	491040	031181	2	2	2	030	0	6	40						0.00	400.3	0.266	
4200	491041	031181	2	2	2	020	0	6	50	0589	132				0.00	47.1	3.27	
4210	491042	031181	2	2	2	015	0		0518	123					0.00		<0.50	
4220	491043	031181	2	2	2	030	0		0827	142					0.00	269.8	<0.50	
4230	491044	031181	2	2	2	020	0	2	0750	0795	140				0.00	218.8	0.064	
4240	491045	031181	2	2	2	060	0		0725	0848	141				0.98	273.1	<0.50	
4250	491046	031181	2	2	2	110	0	2	0750	0805	142				0.73	400.5	0.001	
4260	491047	031181	2	2	2	050	0		0800	0923	150				1.83	275.2	<0.50	
4270	491048	031181	2	2	2	020	0	2	0825	0855	141				0.55	463.3	<0.50	
4280	491049	031181	2	2	2	020	0		0850	0837	140				2.19	236.5	<0.50	
4290	491050	031181	2	2	2	010	0		0660	0600	131				0.67	428.0	<0.50	
4300	491051	031181	2	2	2	070	0		0775	0911	143				0.90		<0.10	
4310	491052	031181	2	2	2	020	0		0910	0656	140				0.00	125.0	1.09	
4320	491053	031181	2	2	2	010	0		0575	0647	133				0.00	86.9	<0.50	
4330	491054	031181	2	2	2	010	0	3	0540	0831	143				0.00	290.1	<0.50	
4340	491055	031181	2	2	2	050	0		0800	0838	142				0.64	329.7	0.443	
4350	491069	041181	2	2	2	020	0		0634	140					0.00	369.8	<0.50	
4360	491070	041181	2	2	2	070	0		0609	140					0.00	199.4	<0.50	
4370	491071	041181	2	2	2	010	0		0528	133					0.00	251.2	<0.50	
4380	491073	041181	2	2	2	010	0		0526	122					0.18		14.32	
4390	491074	041181	2	2	2	010	0	2	0648	141					0.08	186.8	<0.50	
4400	491075	041181	2	2	2	020	0	6	0667	142					0.00	143.6	<0.50	

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123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

ID	DATE	S L P	AGE	C L P	C O	WE	IGHT	S	H	G	L	PROG	ESTRO	PMBO	F
NUMB		P O O		O A A	C N	EST	ACT	CAL	I	R	E	EST	GEN		O
SEQ		E C A U		L C T P	D I				G	T	H	ONE			A
		I T I A		R A A I	T I				H	H					L
		S O T		I I I	I I				T		H				
		N N		N N N	N										

IIIIII		DDMMYY	I I I	I I D	I I I	II	IIII	IIII	IIII	I I D	II	II	IIII	IIIIII	IIII I I I
4410	491076	041181	2 2 2	080	0		0672	140		0 00			294.6		0.547
4420	491077	041181	2 2 2	060	0		0964	151		0 11			245.8		<0.50
4430	491078	041181	2 2 2	020	0		0650	133		0 63			591.6		<0.50
4440	491079	041181	2 2 2	010	0		0644	133		0 00			61.9		<0.10
4450	491080	041181	2 2 2	010	0		0546	123		0 00			365.5		0.613
4460	491081	041181	2 2 2	010	0		0555	130		0 00			115.5		<0.50
4470	491082	041181	2 2 2	010	0		0696	132		4 20					0.012
4480	491083	041181	2 2 2	005	0										
4490	491084	041181	2 2 2	010	0		0578	132		0 00			338.6		<0.50
4500	491085	041181	2 2 2	005	0		0494	113		0 00			507.2		<0.10
4510	491086	041181	2 2 2	030	0		0694	132		7 56					0.195
4520	491087	041181	2 2 2	030	0		0858	142		1 63			187.9		<0.50
4530	491088	041181	2 2 2	015	0		0737	133		0 00					7.04
4540	491128	051181	2 2 2	070	1 5		0977	141		0 00			293.3		<0.50
4550	491129	051181	2 2 2	080	1 2		0690	0860	132	0 31			297.6		<0.10
4560	491130	051181	2 2 2	020	1 2		0650	0394	123	0 00			132.4		0.02
4570	491131	051181	2 2 2	020	1 6		0650	0656	130	0 00			218.0		<0.50
4580	491132	051181	2 2 2	070	1 4		0700	0805	143	0 01			483.9		<0.50
4590	491133	051181	2 2 2	100	1 6		0680	0615	140	0 00			294.3		<0.50
4600	491134	051181	2 2 2	070	1 2		0820	0866	143	0 25			717.5		<0.50
4610	491135	051181	2 2 2	020	1 6		0625	0648	131	0 00			432.1		<0.10
4620	491136	051181	2 2 2	030	1 6		0820	0760	133	2 53					0.023
4630	491137	051181	2 2 2	080	1 6		0750	0783	141	0 00			98.9		<0.50
4640	491138	051181	2 2 2	060	1 1		0825	0808	142	0 00			420.0		<0.50
4650	491139	051181	2 2 2	020	1 2		0670	0699	123	1 21			637.9		<0.50
4660	491140	051181	2 2 2	060	1 5		0725	0827	133	0 00			313.6		<0.50
4670	491141	051181	2 2 2	060	1 1		0750	0928	150	0 00			291.6		<0.50
4680	491142	051181	2 2 2	100	1 6		0750	0906	132	0 00					
4690	491143	051181	2 2 2	080	1 5	50	0880	0525	142	0 00			300.9		<0.50
4700	491144	051181	2 2 2	030	1 6	50	0700	0658	132	0 00			191.4		<0.50
4710	491145	051181	2 2 2	070	1 2	50	0830	0923	150	3 64			0 0		<0.50
4720	491146	051181	2 2 2	030	1 6	50	0650	0600	131	0 00			203.5		<0.50
4730	491147	051181	2 2 2	020	0 1	50	0640	0775	142	0 20			264.4		0.88
4740	491148	051181	2 2 2	020	0 6	50	0650	0615	132	0 00			175.3		0.048
4750	491149	051181	2 2 2	005	0										
4760	491150	051181	2 2 2	050	0 2	40	0625	0583	130	3 25			329.5		0.31
4770	491151	051181	2 2 2	020	0 6	40	0600	0563	132	0 00			295.3		<0.50
4780	491152	051181	2 2 2	080	0 30		0590	0448	122	0 00			227.7		<0.50
4790	491153	051181	2 2 2	020	0 3	40	0600	0583	133	3 34			425.7		
4800	491154	051181	2 2 2	007	0		0467								
4810	491155	051181	2 2 2	030	0 2	50	0550	0512	121	2 26			653.5		0.109
4820	491156	051181	2 2 2	090	0		0366								
4830	491157	051181	2 2 2	020	0 2	40	0590	0532	130	0 68			461.2		<0.50
4840	491158	051181	2 2 2	020	0 2	40	0570	0468	120	2 59			396.4		<0.50

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123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

ID	DATE	S	L	P	AGE	C	L	P	C	WE	IGHT	S	H	O	L	PROG	ESTRO	PMSG	F
NUMB		P	PO	PC		Q	AL	CL	ND	EST	ACT	CAL	I	I	NG	EST	GEN		AL
SEQ		IT	IT	IT		OT	RA	AA	IT				GH	TH	TH	ONE			
		SON					TT	TT	TT										

IIIIII	DDMMYY	I	I	I	II	I	I	II	IIII	IIII	IIII	II	II	IIII	IIIIII	IIII	III
4850	491159	051181	2	2	3	030	0	2	30	0560	0581	130		8.45	1403.9		2.87
4860	491160	051181	2	2	3	005	0	40	0520	0400	120			0.00	233.1		<0.10
4870	491161	051181	2	2	3	060	0	40	0550	0530	123			2.06	129.1		0.897
4880	491162	051181	2	2	3	030	0	2	40	0550	0662	132		4.40	825.2		<0.90
4890	491163	051181	2	2	3	120	0	30	0570	0513	130			1.99			3.49
4900	491164	051181	2	2	3	010	0	6	40	0490	0380	121		0.01	113.7		15.34
4910	491181	061181	2	2	3	030	0	3	50	0690	0722	133		2.06	396.8		5.37
4920	491182	061181	2	2	3	005	0	40	0425	0368	120			0.00	396.6		<0.50
4930	491183	061181	2	2	3	080	0	40	0600	0662	133			0.62	315.3		<0.50
4940	491184	061181	2	2	3	008	0	50	0400	0326	120			0.00	313.7		0.203
4950	491185	061181	2	2	3	070	0	50	0560	0587	123			1.93	350.5		<0.50
4960	491186	061181	2	2	3	020	0	2	50	0525	0322	111		7.09	491.2		2.87
4970	491187	061181	2	2	3	040	0	2	60	0750	0735	140		1.29	284.5		<0.50
4980	491188	061181	2	2	3	020	0	1	50	0550	0526	123		15.75	20.9		21.02
4990	491189	061181	2	2	3	050	0	2	50	0700	0728	132		14.77	199.5		
5000	491190	061181	2	2	3	020	0	2	40	0600	0584	132		1.61	384.8		<0.50
5010	491191	061181	2	2	3	060	0	1	50	0750	0641	121		0.65	138.7		<0.50
5020	491192	061181	2	2	3	010	0	2	40	0575	0519	132		2.70	398.9		<0.50
5030	491193	061181	2	2	3	070	1	40	0570	0435	120			2.88	1403.9		<0.10
5040	491194	061181	2	2	3	030	0	2	50	0590	0465	120		3.52	668.9		<0.50
5050	491219	091181	2	2	3	020	0	30	0445		120			0.00	281.1		<0.50
5060	491220	091181	2	2	3	010	0	6	40	0485	130			0.00	221.6		0.52
5070	491221	091181	2	2	3	070	0	2	35	0650	140			3.79	279.7		<0.10
5080	491222	091181	2	2	3	030	0	2	40	0575	130			2.32	373.9		<0.50
5090	491223	091181	2	2	3	030	0	40	0405	120				0.00	322.5		<0.50
5100	491224	091181	2	2	3	020	0	2	40	0585	132			1.09	371.1		<0.50
5110	491225	091181	2	2	3	070	0	2	40	0705	133			2.41	364.9		<0.50
5120	491226	091181	2	2	3	080	0	2	40	0515	123			0.08	324.1		<0.50
5130	491227	091181	2	2	3	010	0	40	0490	121				0.00	286.1		<0.50
5140	491228	091181	2	2	3	050	0	40	0430	122				0.00	307.7		<0.50
5150	491229	091181	2	2	3	020	0	6	45	0515	130			0.00	456.5		<0.50
5160	491230	091181	2	2	3	080	0	1	45	0665	132			4.67	99.9		<0.50
5170	491231	091181	2	2	3	030	0	2	35	0575	122			3.01	464.0		<0.10
5180	491232	091181	2	2	3	010	0	5	35	0365	123			0.00	462.5		<0.50
5190	491233	091181	2	2	3	070	0	2	40	0630	133			0.90	627.1		<0.50
5200	491234	091181	2	2	3	030	0	6	40	0560	133			0.00	387.0		0.27
5210	491235	091181	2	2	3	005	0	40	0490	120				4.12			3.13
5220	491236	091181	2	2	3	020	0	1	40	0570	123			7.22	244.0		6.65
5230	491237	091181	2	2	3	005	0	40	0460	120				1.53	295.3		<0.50
5240	491238	091181	2	2	3	010	0	2	40	0750	140			1.70	246.4		<0.50
5250	491239	091181	2	2	3	010	0	6	45	0410	122			2.57	61.9		<0.50
5260	491240	091181	2	2	3	005	0	35	0370	120				0.05	109.8		<0.50
5270	491241	091181	2	2	2	020	0	2	50	0880	143			0.34	634.9		<0.50
5280	491242	091181	2	2	2	030	0	2	55	0805	140			5.23	343.7		<0.50

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123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

ID	DATE	SLP	AGE	CL	P	C	WE	IGHT	S	H	O	L	PROG	ESTRO	PMSO	F
NUMB		PO		A	A	A	EST	ACT	CAL	I	R	N	EST	GEN		A
SEQ		CAU		R	A	A				G	T	G	ONE			L
		ITL		T	T	T				H	H	H				
		EIA		I	I	I				T						
		SOT		I	I	I										
		NN		N	N	N										

II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II	II
5290	491243	091181	2	2	2	030	0	6	50		0770	141	0.00	167.0	<0.50	
5300	491244	091181	2	2	2	010	0	5	50		0989	132	0.00	308.2	0.05	
5310	491245	091181	2	2	2	020	0	1	45		0493	132	0.00	79.7	3.88	
5320	491246	091181	2	2	2	015	0	6	40		0445	130	0.00	231.7	<0.50	
5330	491247	091181	2	2	2	010	0	2	50		0745	132	1.64	589.2	<0.50	
5340	491248	091181	2	2	2	015	0	6	50		0555	130	0.00	174.0	1.50	
5350	491249	091181	2	2	2	015	0	5	45		0935	132	0.00	118.2	<0.50	
5360	491252	091181	2	2	2	015	0	5	40		0780	142	0.00	276.5	<0.50	
5370	491347	131281	2	2	2	060	0		40				0.07	276.9	<0.50	
5380	491348	131281	2	2	2	015	0		45		0475	123	1.62	199.7	<0.50	
5390	491349	131281	2	2	2	015	0		40		0495	132	0.79	748.9	<0.50	
5400	491350	131281	2	2	2	015	0		45		0725	133	0.00	449.0	<0.50	
5410	491351	131281	2	2	2	015	0		40		0450	130	8.13		<0.50	
5420	491352	131281	2	2	2	050	0		40				0.10	259.4	0.30	
5430	491353	131281	2	2	2	015	0		45		0565	132	0.00	333.7	<0.10	
5440	491354	131281	2	2	2	015	0		45		0555	133	0.00	992.9	<0.50	
5450	491355	131281	2	2	2	015	0		45		0530	132	0.00	297.1	<0.50	
5460	491356	131281	2	2	2	015	0		45		0705	133	0.00	223.3	<0.50	
5470	491357	131281	2	2	2	015	0		40		0645	141	0.00	167.2	<0.50	
5480	491358	131281	2	2	2	015	0				0720	133	13.60		<0.50	
5490	491359	131281	2	2	2	005	0				0525	130	0.00	151.8	<0.50	
5500	491360	131281	2	2	2	015	0		45		0615	133	0.00	295.9	<0.50	
5510	491361	131281	2	2	2	040	1		45		0770	133	3.83		<0.50	
5520	491362	131281	2	2	2	080	1		45		0820	133	3.73		<0.50	
5530	491363	131281	2	2	2	080	1		40		0825	133	2.69		<0.50	
5540	491364	131281	2	2	2	020	1		40		0625	132	0.00	298.6	<0.10	
5550	491365	131281	2	2	2	040	1		45		0795	140	3.15		<0.50	
5560	491366	131281	2	2	2	020	1		45		0765	143	0.00	316.9	<0.10	
5570	491367	131281	2	2	2	050	1		35		0680	133	3.05		<0.50	
5580	491288	131281	2	2	2	020	0		40		0650	133	0.00	349.0	<0.50	
5590	491290	131281	2	2	2	020	0		30		0680	132	2.41		<0.50	
5600	491291	131281	2	2	2	010	0		50		0645	131	0.00	252.9	<0.30	
5610	491292	131281	2	2	2	010	0		45		0730	132	2.78		<0.50	
5620	491293	131281	2	2	2	010	0		40				2.34		<0.50	
5630	491294	131281	2	2	2	010	0		45		0635	123	0.00	76.1	<0.50	
5640	491295	131281	2	2	2	010	0		45				0.00	102.4	<0.50	
5650	491296	131281	2	2	2	070	1		40		0690	133	0.00	218.8	<0.50	
5660	491297	131281	2	2	2	070	1		40		0710	140	0.00	121.7	0.12	
5670	491298	131281	2	2	2	050	1		40		0850	143	1.90	348.6	0.31	
5680	491299	131281	2	2	2	100	1				0800	132	0.01	221.8	<0.50	
5690	491300	131281	2	2	2	050	1				0630	132	0.00	210.7	<0.10	
5700	491301	131281	2	2	2	080	1		45		0785	133	2.60		<0.50	
5710	491302	131281	2	2	2	060	1		40		0835	133	2.43	153.7	<0.50	
5720	491303	131281	2	2	2	060	1		40		0915	143	1.88	110.4	<0.50	

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 123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

ID NUMB	DATE	S P O D E C A U I T L E I A S O T N N	L P O A G E C A U I T L E I A S O T N N	C L P C O A A O T P R A A I T T I I N	---WE EST	IGHT ACT	S--- CAL	H E I G H T	O I R T H	L E N G T H	PROG EST ONE	ESTRO GEN	PMSG	F O A L
SEG														

II IIII	DDMMYY	I I I	I I I	I I I	I I	IIII	IIII	IIII	I I I	I I I	I I I	IIII	IIII	IIII	IIII
5730 491304	131281	2 2 2	030	1	35	0600	132	0.00	413.4	<0.50					
5740 492962	090282	2 2 1	070	0 0	30			0.00		<0.50					
5750 490001	090282	2 2 1	205	0 6	30			0.00	140.4	<0.50					
5760 490002	090282	2 2 1	120	1 3	30			1.51							
5770 490003	090282	2 2 1	050	0 6	40			0.00	125.2						
5780 492896	090282	2 2 1	130	0 4	30			0.00	152.4	<0.50					
5790 492982	090282	2 2 1		0 4	40			3.46	140.7	<0.50					
5800 492955	090282	2 2 1		0	40			1.19	339.7	<0.50					
5810 492966	090282	2 2 1		0	40			0.00	104.1	<0.50					
5820 492816	090282	2 2 1		0	40			2.19	253.1	<0.50					
5830 493063	090282	2 2 1		1	30			0.00		42.52					
5840 492303	090282	2 2 1						0.00	183.7	<0.50					
5850 492529	090282	2 2 1		0				0.00	114.8	<0.50					
5860 492814	090282	2 2 1		0				0.77	459.5	<0.50					
5870 492515	090282	2 2 1		0				1.63	232.5	<0.50					
5880 492132	090282	2 2 1						1.50	265.1	<0.50					
5890 492653	090282	2 2 1						0.00	163.3	<0.50					
5900 492463	090282	2 2 1						0.00	98.9	<0.50					
5910 492570	090282	2 2 1						3.40		<0.50					
5920 190890	270382	1 5 2	010	0				0.23	83.2	<0.50					
5930 190893	270382	1 5 2	040	0				72.94		<0.50					
5940 190896	270382	1 5 2	060	0				46.88		1.36					
5950 190897	270382	1 5 2	030	0				2.96		0.58					
5960 190898	270382	1 5 2	050	1				8.93		<0.50					
5970 190901	270382	1 5 2	010	0				0.08	74.1	<0.50					
5980 190902	270382	1 5 2	020	0				15.13		<0.50					
5990 190903	270382	1 5 2	020	0				9.18		<0.50					
6000 190904	270382	1 5 2	040	1				19.73		<0.50					
6010 190906	270382	1 5 2	050	0				15.17		<0.50					
6020 190907	270382	1 5 2	040	0				12.81		<0.50					
6030 190908	270382	1 5 2	020	0				5.20		<0.50					
6040 190909	270382	1 5 2	020	0				0.09	46.9	<0.50					
6050 190818	270382	1 5 2		0				1.52	106.4	<0.50					
6060 190864	270382	1 5 2		1				8.13		<0.50					
6070 190486	270382	1 5 2		0				2.17	60.8	<0.50					
6080 190861	270382	1 5 2		0				13.07		<0.50					
6090 190749	270382	1 5 2		0				4.61		<0.50					
6100 190867	270382	1 5 2		0				11.47		<0.50					
6110 190883	270382	1 5 2		0				10.29		<0.50					
6120 190878	270382	1 5 2		0				5.92		1.76					
6130 190873	270382	1 5 2		1				0.00	52.7	<0.50					
6140 190872	270382	1 5 2		0				5.12		<0.50					
6150 190868	270382	1 5 2		0				0.01	73.7	<0.50					
6160 190865	270382	1 5 2		0				6.90		<0.50					

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123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

ID	DATE	SLP P O D E C A U I T L E I A S O T N	AGE	CL P O A A L C L O T P R A A T T T I I I N N N	C O O N I I N	WEIGHT S-- EST ACT CAL	H E I G H T	G I R T H	L E N G T H	PROG EST ONE	ESTRO GEN	PMSG	F O A L
SEQ													

IIIIII	DDMMYY	I I I	I I I	I I I	I I I	I I I	I I I	I I I	I I I	I I I	I I I	I I I	I I I	I I I	I I I	I I I	I I I	I I I
6170	190536	270382	1	5	2	100	0						1.71	149.9		<0.50		
6180	190478	270382	1	5	2	040	0						0.04	41.5		0.53		
6190	190791	270382	1	5	2	110	0						8.92			1.88		
6200	190800	270382	1	5	2	030	0						17.98			1.34		
6210	190814	270382	1	5			0 3						15.74			<0.50		
6220	190875	270382	1	5	2	010	0						1.05	95.5		<0.50		
6230	190912	280382	1	5	2	020	0						12.48			<0.50		
6240	190913	280382	1	5	2	040	0		0410	113	52	50	11.95			<0.50		
6250	190914	280382	1	5	2	010	0						0.31	87.4		<0.50		
6260	190917	280382	1	5	2	040	0						9.16			<0.50		
6270	190923	280382	1	5	2	020	0						0.48			<0.50	922	
6280	190924	280382	1	5	2	050	0						5.83			1.52	914	
6290	190925	280382	1	5	2	030	0						11.02			<0.50		
6300	190927	280382	1	5	2	010	0		0255	101	43	40	0.62	62.9		<0.50		
6310	190928	280382	1	5	2	010	0						40.26			2.86		
6320	190929	280382	1	5	2	010	0						0.03	59.8		<0.50		
6330	190930	280382	1	5	2	020	0		0375	111	50	48	9.07			<0.50		
6340	190931	280382	1	5	2	020	0		0415	120	54	43	8.15			<0.50		
6350	190932	280382	1	5	2	050	1						0.91	50.6		<0.50		
6360	190934	280382	1	5	2	040	0						17.08			<0.50	926	
6370	190946	290382	1	5	2	010	0						0.04	63.6		<0.50		
6380	190947	290382	1	5	2	020	0						9.85			<0.50		
6390	190948	290382	1	5	2	110	0						1.56	51.3		<0.50		
6400	190949	290382	1	5	2	150	0						17.16			25.65		
6410	190952	290382	1	5	2	015	0						29.34			<0.50		
6420	190953	290382	1	5	2	050	0						11.49			<0.50		
6430	190956	290382	1	5	2	005	0						0.05	85.4		<0.50		
6440	190958	290382	1	5	2	010	0						0.60	56.0		<0.50	956	
6450	190961	290382	1	5	2	030	0						6.97			<0.50		
6460	190967	290382	1	5	2	010	0						0.00	48.1		<0.50		
6470	190968	290382	1	5	2	020	0		0420	113	53	45	30.80			<0.50		
6480	190969	290382	1	5	2	020	0						4.15			<0.50		
6490	190970	290382	1	5	2	020	0		0455	121	53	52	20.89			<0.50		
6500	190971	290382	1	5	2	030	0		0410	121	53	50	5.55			<0.50		
6510	190959	290382	1	5	2	070	0						71.55			<0.50		
6520	190974	290382	1	5	2	030	0		0420	113	53	49	15.36			<0.50		
6530	190943	310382	1	5	2	010	0						0.01	53.0		<0.50		
6540	190975	310382	1	5	2	010	0						0.23	43.7		<0.50		
6550	190978	310382	1	5	2	030	0						0.25	110.3		<0.50		
6560	190979	310382	1	5	2	060	0						10.22			<0.50		
6570	190980	310382	1	5	2	010	0						10.59			<0.50		
6580	191053	090482	1	5	2	050	0						11.33			<0.50		
6590	191028	090482	1	5	2	050	0						9.83			3.62		
6600	191002	090482	1	5	2	020	0						7.93			0.33		

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123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

ID	DATE	S L P	P O D	A G E	C L P	C O	--WE	I G H T	S--	H	O	L	PROG	ESTRO	PMSG	F
NUMB		E C P	C A U		L C L	O N	EST	ACT	CAL	I	R	E N G	EST	GEN		O A L
SEQ		I T L	E I A	S G T	R A A	T T T				H	T	H	ONE			
		N N	N N	N N	N N	N N				T						

IIIII	DDMMYY	I I I	I I D	I I I	II	IIII	IIII	IIII	I I D	II	II	IIII	IIIIII	IIIII	III
6610	191025	090482	1 5 2	010	0							0.00	29.1		<0.50
6620	191007	090482	1 5 2	100	0							20.54			0.42
6630	191006	090482	1 5 2	010	0							12.78			8.32
6640	191046	090482	1 5 2	080	0							6.22			<0.50
6650	191045	090482	1 5 2	020	0							5.93			<0.50
6660	191037	090482	1 5 2	010	0							1.41	263.3		<0.50
6670	190756	090482	1 5 2	050	0							6.57			<0.50
6680	190995	090482	1 5 2	030	0							20.08			<0.50
6690	191004	090482	1 5 2	010	0							0.00	110.7		0.26
6700	191001	090482	1 5 2	030	0							3.92			0.91
6710	191030	090482	1 5 2	020	0							3.95			0.24
6720	191013	090482	1 5 2	030	0							4.70			<0.50
6730	191005	090482	1 5 2	060	0							32.30			<0.50
6740	191054	090482	1 5 2	080	0							15.00			0.65
6750	191043	090482	1 5 2	040	0							17.03			<0.50
6760	191009	090482	1 5 2	050	0							10.08			0.54
6770	191064	090482	1 5 2	040	0							0.65	85.6		0.27
6780	191040	090482	1 5 2	120	0							4.09			<0.50
6790	191038	090482	1 5 2	020	0							6.21	43.1		<0.50
6800	191017	090482	1 5 2	060	0							9.89			<0.50
6810	191022	090482	1 5 2	030	0							6.67			0.91
6820	191090	090482										0.75	50.5		<0.50
6830	190795	090482	1 5 2		0							12.71			<0.50
6840	190942	090482	1 5 2		0							0.32	205.3		0.94
6850	191033	090482	1 5 2	040	0	3						4.98			<0.50
6860	191068	100482	1 5 2	080	1							15.34			<0.50
6870	191069	100482	1 5 2	020	0							6.80			<0.50
6880	191072	100482	1 5 2	050	0							0.40	87.3		<0.50
6890	191075	100482	1 5 2	020	0							0.00	115.1		<0.50
6900	191076	100482	1 5 2	030	0							6.20			<0.50
6910	191078	100482	1 5 2	020	0							0.05	126.4		0.20
6920	191088	100482	1 5 2	010	0							0.16			<0.50
6930	191094	100482	1 5 2	040	1							2.41	91.8		0.30
6940	191096	100482	1 5 2	010	0							0.00	62.5		0.22
6950	191097	100482	1 5 2	100	0							10.05			0.22
6960	191101	100482	1 5 2	050	0							14.41			<0.50
6970	191104	100482	1 5 2	100	0							9.98			<0.50
6980	191105	100482	1 5 2	100	0							6.83			<0.50
6990	191106	100482	1 5 2	010	0							1.08	77.1		<0.50
7000	191285	220482	1 5 3	040	0 3			0365				9.04	89.2		<0.50
7010	191275	220482	1 5 3	060	0 3							12.61	289.3		0.50
7020	191242	220482	1 5 3	005	0 0			0167				0.00	54.0		<0.50
7030	191267	220482	1 5 3	010	0 0			0195				0.00	75.7		<0.50
7040	191257	220482	1 5 3	040	0 0			0315				15.42			6.33

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 123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

ID	DATE	S L P	AGE	C L P	C	WEIGHT	H	G	L	PROG	ESTRO	PMSC	F
NUMB		POD		QAAA	ON	S--	E	I	E	EST	GEN		O
		EC		LC	ND	ACT	I	R	NG	ONE			A
REG		ITL		RATA	IT		H	H	T				L
		ETIA		TTT	IT								
		SOT		INN	IN								

IIIIII	DDMMYY	I	I	I	I	I	I	II	IIII	IIII	IIII	IID	II	II	IIII	IIIIII	IIIIII III
7090 191263	220482	1	5	3	020	0	0		0340						4.25		0.29
7060 191279	220482	1	5	3	020	0	0		0280						5.44		<0.50
7070 191258	220482	1	5	3	030	0	0		0257						16.78		<0.50
7080 191243	220482	1	5	3	020	0	0		0315						0.00	94.1	<0.50
7090 191248	220482	1	5	3	020	0	1		0290						8.89	66.2	<0.50
7100 191260	220482	1	5	3	050	0	0		0346						19.49	28.1	5.92
7110 191297	220482	1	5	3	040	0	3		0370						15.23	142.3	<0.50
7120 191254	220482	1	5	3	040	0	2		0367						4.34	142.5	1.06
7130 191246	220482	1	5	3	100	0	3		0387						10.67	298.7	<0.50
7140 191271	220482	1	5	3	030	0	2		0360						5.43	144.3	0.26
7150 191286	220482	1	5	3	005	0	2		0170						0.00		<0.50
7160 191272	220482	1	5	3	010	0	1		0227						0.20	63.3	0.33
7170 191295	220482	1	5	3	020	0	1		0302						17.61	89.0	7.32
7180 191264	220482	1	5	3	080	0	1		0327						20.87	82.5	11.73
7190 191280	220482	1	5	3	040	0	1		0340						9.60	38.1	5.65
7200 191296	220482	1	5	3	020	0	3		0355						3.91	94.8	<0.50
7210 191279	220482	1	5	3	020	0	0		0260						22.43	86.6	0.53
7220 191293	220482	1	5	3	010	0	0		0235						0.00	71.8	<0.50
7230 191301	220482	1	5	3	060	0	3		0330						8.95	387.4	2.81
7240 191307	220482	1	5	3	050	0	1		0310						1.09	125.3	0.44
7250 191309	220482	1	5	3	020	0	1		0250						9.96	48.4	<0.50
7260 191316	220482	1	5	3	020	0	0		0277						11.35	105.2	6.72
7270 191317	220482	1	5	3	020	0	1		0280						16.63	70.7	<0.50
7280 191320	220482	1	5	3	060	1	1		0328						24.24	52.8	0.24 322
7290 191322	220482	1	5	3	005	0	0		0175						22.11	85.4	<0.50
7300 191325	220482	1	5	3	060	0	3		0387						16.46	181.4	<0.50
7310 191326	220482	1	5	3	020	0	3		0296						4.07	158.2	<0.50
7320 191328	220482	1	5	3	030	0	3		0360						6.79	184.3	<0.50
7330 191329	220482	1	5	3	020	0	3		0375						5.87	184.4	<0.50
7340 191330	220482	1	5	3	070	0	3		0400						9.02	165.3	<0.50
7350 191029	250482	1	5	3		0	0										
7360 191334	250482	1	5	1	020	0									4.12		<0.50
7370 191336	250482	1	5	1	030	0									7.77		<0.50
7380 191338	250482	1	5	1	040	0									15.23		<0.50
7390 191339	250482	1	5	1	010	0									6.52		<0.50
7400 191343	250482	1	5	1	050	0									36.35		<0.50
7410 191344	250482	1	5	1	020	0									13.49		<0.50
7420 191346	250482	1	5	1	005	0									0.00	76.1	<0.50
7430 191349	250482	1	5	1	030	1									3.72		<0.50
7440 191351	250482	1	5	1	130	1									9.29		<0.50
7450 191354	250482	1	5	1	090	0									2.35	167.8	<0.50
7460 191355	250482	1	5	1	090	1									7.66		<0.50
7470 191356	250482	1	5	1	020	0									24.65		1.14
7480 191357	250482	1	5	1	030	0									8.39		7.77

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123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890

[illegible]

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123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 8901
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ID
NUMB

DATE

SLP
P O D AGE
E C P
C A U
I T L
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S O T
N NC L P C
O A A O
L C L N
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I I I
N N N--WE IGH T S--
EST ACT CALH E
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IIIIII

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II IIII IIII IIII

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7930 NON PR EQ MARE

72.0

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7940 MADGE

71.9

1.11

7950 LIVER CHESTNUT

247.6

1.01

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123456 789012345 67 8 9 012 3 4 5 678 90123 4567 8901 2345 678 901 23456 789012345 6789012 34567 890